

LISTING OF CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

Claim 1. (Withdrawn): A method of manufacturing a semiconductor device for forming an MIM capacitor over a substrate, said MIM capacitor comprising a metal lower electrode having an extending main part, and a plurality of fins laterally extending relative to said main part, said MIM capacitor further comprising a metal upper electrode, and a dielectric film held between said upper electrode and said lower electrode, wherein

at least one of said plurality of fins farthest from said substrate, and said main part, are formed by the same process.

Claim 2. (Withdrawn): The method according to claim 1, wherein said lower electrode extends upwardly from said substrate, and said upper electrode surrounds said lower electrode.

Claim 3. (Withdrawn): The method according to claim 1, wherein all of said plurality of fins and said main part are formed by the same process.

Claim 4. (Withdrawn): The method according to claim 1, comprising the steps of:
depositing a plurality of first insulating films and a plurality of second insulating films in alternate layers;

performing anisotropic etching on said plurality of first insulating films and said plurality of second insulating films in alternate layers, to create a first opening penetrating said plurality of first insulating films and said plurality of second insulating films;

performing etching in said first opening in such a manner that said first insulating film is etched at a higher etching rate relative to said second insulating film, to form a second opening where an end surface of said first insulating film is recessed relative to an end surface of said second insulating film; and

filling said second opening with a first metal film, to form said main part and said plurality of fins.

Claim 5. (Withdrawn): The method according to claim 4, further comprising the steps of:

creating a third opening to surround said main part and said plurality of fins; and
depositing a dielectric film and a second metal film in said third opening, to be stacked in this order relative to said first metal film.

Claim 6. (Withdrawn): The method according to claim 5, wherein
a third metal film, said dielectric film, and said second metal film are deposited in said third opening, to be stacked in this order relative to said first metal film, said first insulating film, and said second insulating film, and
said first metal film and said third metal film together are operative to serve as said lower electrode.

Claim 7. (Withdrawn): The method according to claim 1, comprising the steps of:
depositing a plurality of insulating films and a plurality of metal films in alternate layers;

performing anisotropic etching of said plurality of insulating films and said plurality of metal films in alternate layers, to create an opening penetrating said plurality of insulating films and said plurality of metal films; and

filling said opening with another metal film, to form said main part.

Claim 8. (Withdrawn): A method of manufacturing a semiconductor device, comprising the steps of:

providing a second insulating film on a first insulating film;
creating a first opening penetrating said first insulating film and said second insulating film;
providing a first metal film to fill said first opening;
widening said first opening to create a second opening; and
depositing a dielectric film and a second metal film in said second opening, to be stacked in this order relative to said first metal film.

Claim 9. (Withdrawn): The method according to claim 8, wherein said second opening exposes said first insulating film.

Claim 10. (Withdrawn): The method according to claim 8, wherein said second opening has a bottom defined in said second insulating film, and said first metal film protrudes from said bottom of said second opening.

Claim 11. (Withdrawn): The method according to claim 8, wherein said second opening penetrates said first insulating film and said second insulating film.

Claim 12. (Withdrawn): The method according to claim 8, wherein
an insulating film is provided to a sidewall of said first opening, and
said second opening is created by removing said insulating film.

Claim 13. (Withdrawn): The method according to claim 8, wherein
a third metal film, said dielectric film, and said second metal film are deposited in
said second opening, to be stacked in this order relative to said first metal film and said
second insulating film, and

said first metal film and said third metal film together are operative to serve as a lower
electrode of a capacitor.

Claim 14. (Withdrawn): The method according to claim 9, wherein
a third metal film, said dielectric film, and said second metal film are deposited in
said second opening, to be stacked in this order relative to said first metal film and said
second insulating film, and

said first metal film and said third metal film together are operative to serve as a lower
electrode of a capacitor.

Claim 15. (Withdrawn): The method according to claim 10, wherein
a third metal film, said dielectric film, and said second metal film are deposited in
said second opening, to be stacked in this order relative to said first metal film and said
second insulating film, and

said first metal film and said third metal film together are operative to serve as a lower
electrode of a capacitor.

Claim 16. (Withdrawn): The method according to claim 11, wherein
a third metal film, said dielectric film, and said second metal film are deposited in
said second opening, to be stacked in this order relative to said first metal film and said
second insulating film, and
said first metal film and said third metal film together are operative to serve as a lower
electrode of a capacitor.

Claim 17. (Withdrawn): The method according to claim 12, wherein
a third metal film, said dielectric film, and said second metal film are deposited in
said second opening, to be stacked in this order relative to said first metal film and said
second insulating film, and
said first metal film and said third metal film together are operative to serve as a lower
electrode of a capacitor.

Claim 18. (Currently Amended): A method of manufacturing a ~~semiconductor device~~
capacitor having a dual purpose lower electrode, comprising the steps of:

creating a first opening and a second opening wider than said first opening in an
insulating film, said first opening penetrating through said insulating film to expose an area
below said insulating film, said second opening having a bottom in said insulating film; and
depositing a first metal film, a dielectric film, and a second metal film, to be stacked
in this order in said first opening ~~and~~ with only said first metal film being deposited so as to
extend into and to fill the second opening so as to act as a contact plug to the exposed area
below the insulating film, wherein

said second metal film is operative to serve as an upper electrode of said capacitor,
and
the dielectric film is operative to serve as a dielectric layer of said capacitor; and
at least said first metal film in filling said second opening is operative to serve as a the
lower electrode of said capacitor while also serving as the contact plug.

Claim 19. (New): A method of manufacturing a semiconductor device, comprising
the steps of:

creating a separate first opening and a separate third opening completely through an
insulating film using a same process;

creating a second opening in said insulating film communicating with said first
opening but not said third opening, said second opening being wider than said first opening
and having a bottom in said insulating film; and

depositing a first metal film, a dielectric film, and a second metal film, to be stacked
in this order above said first opening with only said first metal film being deposited so as to
extend into and to fill the first and the third opening so as to form contact plugs to an area
exposed by the first and third openings, wherein

said second metal film is operative to serve as an upper electrode, and
at least said first metal film in said second opening is operative to serve as a lower
electrode.